

Having thus, described the invention, what is claimed is:

1. A swash plate plunger type hydraulic unit comprising:
  - a cylinder which is rotatably supported and has a plurality of plunger holes extending in an axial direction and arranged in a loop to surround a rotation axis thereof ;
  - a plurality of plungers slidably disposed in the respective plunger holes;
  - a swash plate which has a swash plate face to be contacted to outer end portions of the plungers, and which may be tilted and rolled about a rolling axis perpendicular to the rotation axis as a center to change the tilting angle of the swash plate face; and
  - a swash plate servo device for tilting and rolling the swash plate, the swash plate servo device comprising:
    - a screw shaft having a male screw;
    - a nut member which has a ball thread on an inner wall thereof and is mated with the male screw and connected to the swash plate;
    - a servo drive device which drives the screw shaft to move the nut member over the screw shaft in an axial direction to tilt and roll the swash plate; and
    - a stopper attached to an end portion of the screw shaft to limit a moving range of the nut member, the stopper including a cylindrical ring portion which has almost the same outer diameter as the outer diameter of the male screw portion and is situated adjacent to the end portion of the male screw portion at a limit position of the nut member, and a flange portion which has a larger diameter than the ring portion and which contacts a side face of the nut member at the limit position.
2. The swash plate plunger type hydraulic unit according to claim 1, wherein the ring portion of the stopper projects within the nut member at the limit position of the nut member.
3. The swash plate plunger type hydraulic unit according to claim 1, wherein an end of

the ball thread on the inner wall of the nut member is spaced inwardly of the side face of the nut member in the axial direction.

4. The swash plate plunger type hydraulic unit according to claim 2, wherein an end of the ball thread on the inner wall of the nut member is spaced inwardly of the side face of the nut member in the axial direction.

5. The swash plate plunger type hydraulic unit according to claim 1, further including a plurality of balls disposed within the nut member between the ball screw and the male screw.

6. The swash plate plunger type hydraulic unit according to claim 1, wherein the servo drive device includes a motor and an output shaft of the motor is operatively connected to the screw shaft.